Serving and supplying the clean energy sector

OEG's Local Equipment Room modules installed on the London Array offshore substation topside structures. Credit London Array © courtesy of London Array

OEG Offshore entered the wind power and renewables market in 2010, with a substantial contract award for the landmark London Array Offshore Wind Farm, in the Thames Estuary. A decade on, the company offers a combined portfolio of products and services to the clean energy sector including bespoke module builds, sale and rental of DNV certified containers and offshore aviation services.

The £2.2 million order placed by Siemens Transmission and Distribution Ltd., for the London Array Offshore Wind Farm included the design and custom build of eighteen prefabricated modular Local Equipment Rooms (LER) to house specialist electrical distribution equipment along with workshop and emergency accommodation facilities.

Siemens selected a modular approach as it allowed a fast and efficient platform build to meet the tight timescales for the project.

The offshore substation platform modules included:

- Switchgear modules (150kv / 33kv)
- Offshore Transmission Owner (OFTO) control rooms
- LVAC / LVDC: Low Voltage systems
- Metering modules
- Welfare / refuge buildings and a workshop /office

The LER modules, equipped with lighting, monitoring systems, HVAC, fully pressurised and built to the American Institute of Steel Construction (AISC) structural code standards, were designed to an offshore specification, and had similar properties to OEG's Variable Speed Drive (VSD) modules and service modules supplied to the oil and gas sector.

In terms of an offshore specification for a modular solution this typically defines the main technical requirements for design, fabrication, coating, mechanical, electrical, fire & gas systems, HVAC, architectural and testing. It also details references to international codes and standards, safety and quality requirements, environmental conditions, scope of work, certification and Factory Acceptance Testing (FAT).

Nevertheless, operational safety is typically the main driver behind the requirement for an offshore specification. This ensures materials and equipment utilised within the design are suitable for transportation and lifting in hostile offshore environments and

OEG Offshore provided a range of cargo carrying units for the Global Tech 1 wind farm project in the German North Sea © Wolfhard Scheer

Welfare module

safeguards personnel and equipment when in operation, within a safe area or hazardous area location.

Offshore containers are subject to design and build regulations and certified in compliance with international or regional standards by a recognised inspection body.

The bespoke service modules for the London Array Offshore Wind Farm were shipped to Belgium for integration into the substations' topside structures on location at the Fabricom yard in Hoboken. This was achieved without major disruption to the platform manufacturer's operations, before transportation offshore for final installation on the platforms using the Rambiz crane barge.

Key deliverables for the project included full design and engineering of all units within the topside structures, modules fully painted to offshore specification and ready for outfitting, together with the installation including the hook up of the customer's free-issue, high specification and high value equipment in OEG's environmentally controlled modular manufacturing facility. The project team also supervised the installation of all units inside the topsides and final handover to the yard and customer, for another successful module build project.

A decade on and OEG Offshore is now an established and experienced partner to the growing global renewables sector, with a long list of similar contracts successfully completed.

These have included a FEED study for the Beatrice Offshore Wind Farm, based on a fully integrated modular design suitable for installation onto the transformer platform topside. Furthermore, OEG designed and built a 32ft x 11ft A60 fire rated module for use as an emergency refuge/overnight shelter for the Ormonde Wind Farm Project.

The engineering and project teams in Aberdeen design and build service modules and standard work cabins to the highest industry standards of AISC, ISO 10855, DNV 2.7-1, DNV 2.7-2, DNV 2.7-3,

BS EN 60079, NORSOK, IEC and ATEX, including compliance with SOLAS/IMO regulatory requirements for fire protection.

All modular solutions are designed to optimise workspace efficiency, meet environmental and acoustic requirements, and house offshore personnel or specialist equipment in complete safety.

In addition to bespoke module containers, OEG Offshore is well-known for the sale and rental of standard and modified DNV 2.7-1 certified cargo carrying units (CCUs) used to transport raw materials to support foundation grouting, offshore construction, wind turbine installation, commissioning, and maintenance related activities.

Popular offshore cargo unit designs include open top containers, waste skips, gas bottle racks, refrigerated containers and workshop containers or tool stores.

Typical CCU rental contracts to support cementing and grouting activities for wind turbine installation in the UK and Europe, include: heavy lift open top containers, with an MGW of 25,000kg, boat skips, baskets, and workshops, as well as the design and build of ten, ultra-heavy duty, 20ft open top containers to the latest DNV 2.7-1 specification, with payload capacity of over 22,000kg for the Global Tech 1 Wind Farm, in the North Sea in Germany.

The Moray Offshore Windfarm (East) Limited (MOWEL) development in the North Sea is the most recent renewables project OEG has supplied cargo units to with the sale of a 20ft DNV 2.7-1 dry goods container. The unit is currently being utilised onboard the 'Havila Venus' vessel which is on-site conducting route preparation work for the new development.

David Hunter, UK Operations Director for OEG Offshore says, 'We have a strong reputation for providing specialist offshore modules as well as standard and modified CCUs for offshore wind farm developments. Our project team is highly skilled and familiar with the critical systems that need to be safely transported offshore or containerised to meet the project challenges faced in the offshore wind sector.

'With OEG's global network of full-service bases strategically located to support this sector we also have the opportunity to deliver high standards for quality, reliability and speed of service for existing and new offshore wind developments in the emerging American and Asian markets.'

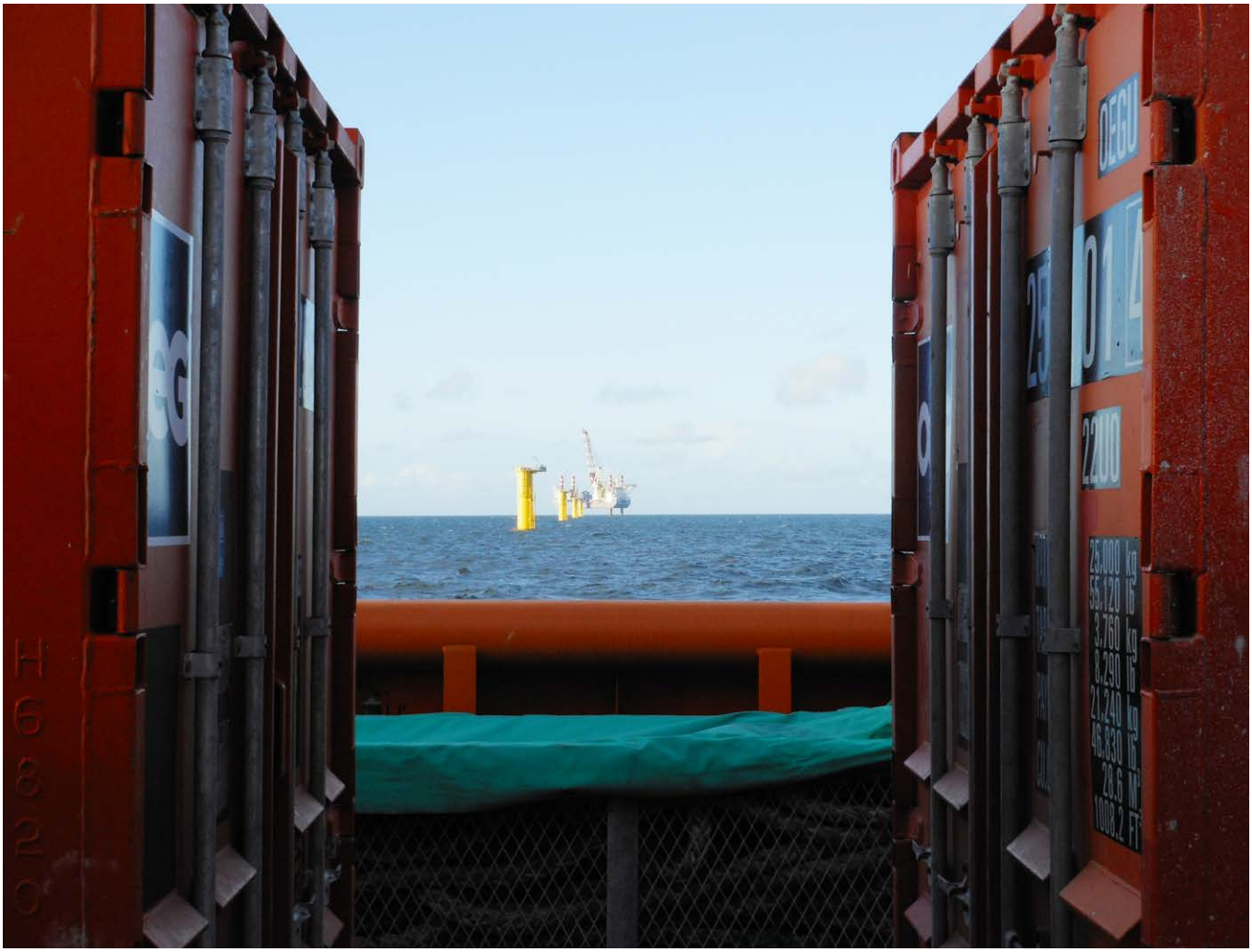
In 2019 OEG Offshore acquired a leading offshore aviation refuelling services specialist, Harran Limited, offering inspection and certification services relating to helicopter refuelling and helideck operations.

Through Harran Limited, the wind farm supply chain can access bespoke helifuel systems that commonly include a dispensing unit, pump unit, laydown skid and Jet A-1 transportable tanks. In addition, cost efficient helifuel equipment refurbishment, managed supply of helifuel sampling consumables and refuelling spares, along with helideck compliance audits, which are all to the UK CAA CAP 437 standard, are available.

Over the years Harran's team of aviation experts, principally Stevie Skinner, Technical Manager, have shaped Chapter 7* and 8** of the Civil Aviation Authority (CAA) CAP 437 standards for offshore helicopter landing areas.

During a typical contract for a wind farm development, an experienced technician can complete a range of services in one trip from surface helideck friction testing, helifuel compliance audits and certification, all compliant to UK CAA CAP 437, along with helicopter refuelling training and

OEG Offshore's custom-built Local Equipment Room (LER) modules for the London Array Offshore Wind Farm



OEG's cargo units used for the safe transportation and storage of materials for foundation grouting, offshore construction, wind turbine installation and maintenance related activities. Credit FoundOcean Ltd.

competency assessments. This results in huge cost efficiencies and reduced inter-field transfers of personnel for the operator.

Harran's superior helifuel training package is gaining recognition throughout the offshore aviation industry, with a strong focus on evidence-based competency, rather than a purely theoretical approach.

Training packages are tailormade for any individual or team involved in the refuelling of helicopters and system checks offshore. The helifuel system on the offshore installation is utilised as part of the field-based learning to provide optimum understanding and familiarisation when carrying out safety critical helifuel checks in line with regulatory guidelines. The course also delivers detailed content on the latest regulatory standards to ensure compliance with safe offshore helicopter refuelling practices.

Furthermore, Harran is pleased to be able to support and advise global energy training provider, OPTIO regarding the ongoing development of a new Helifuel training standard for offshore helifuel operations, expected later this year.

Clive Hoskisson, Managing Director of Harran Limited states, 'We have over 30 years' experience and proven manufacturing practices to deliver high quality offshore helicopter refuelling systems and offshore helideck services to international standards. As regulations change, we keep customers informed of the updated requirements to ensure compliance with the current CAP 437 regulations.'

'Our highly respected and multi-skilled team is extremely knowledgeable and provides reliable technical guidance to duty holders and other helideck teams relating to inspection and certification compliance for offshore wind substations.'

Harran continue to lead the way in supplying aviation products and services vital for the smooth and safe delivery of helicopter operations in the energy industry. Offshore wind customers can benefit from these services from Harran's Aberdeen and Great Yarmouth bases as well as through OEG's global base network.

The clean energy sector has and will continue to provide a global opportunity for the OEG Offshore group of companies, as there are many similarities with the oil and gas industry.

*Chapter 7: Helicopter fuelling facilities – Systems design and construction

**Chapter 8: Helicopter fuelling facilities – Maintenance and fuelling procedures

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OEG Offshore, specialists in the design, build, rental and sale of DNV 2.7-1 cargo carrying units (CCUs), A60 cabins and bespoke modular solutions to the global energy industry, also supports major offshore wind projects, from a network of bases in the UK, Europe and the rest of the world.